

PRIMARY LUNG TUMOR IN A DOG

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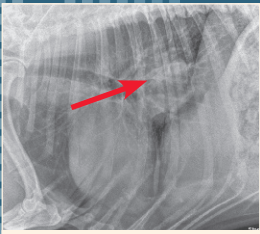


Figure 1: Mass in right caudal thorax (red arrow), involving/adjacent to the mediastinum.

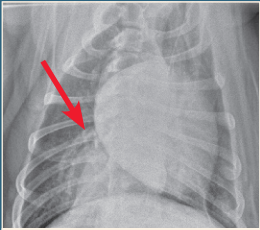


Figure 2: Mass in right caudal thorax (red arrow), involving/adjacent to the mediastinum.

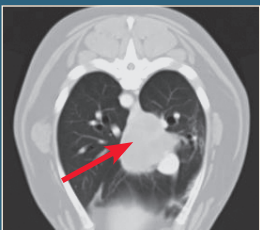


Figure 3: Positive-contrast CT with a transverse cross-sectional image of the thorax, demonstrating the right accessory lung lobe mass (red arrow).

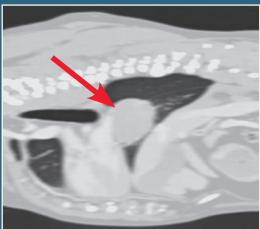


Figure 4: Sagittal reconstruction of the CT, demonstrating the right accessory lung lobe mass (red arrow).

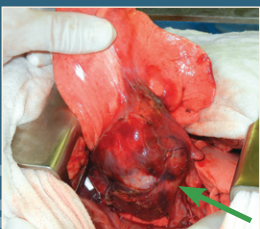


Figure 5: Bronchoalveolar carcinoma (green arrow) within the right accessory lung lobe.

Primary lung tumors are uncommon tumors, more often affecting geriatric large-breed dogs. This case presentation describes a dog diagnosed with a primary lung tumor and the diagnostics and treatment performed to address the tumor.

History

Maggie is a 9 year-old female spayed Boxer who, two weeks prior to presentation, developed an acute onset of dry coughing. The coughing occurred throughout the day with no apparent trigger, and Maggie would occasionally gag and produce a clear mucous after coughing. The owner also noticed a decreased appetite and lethargy. Thoracic radiographs revealed a soft tissue density in the caudal thorax, either adjacent to or within the mediastinum. The bifurcation of the trachea was ventrally displaced and the caudal margin of the cardiac silhouette was obscured by the soft tissue density. A cardiac work-up revealed minor and clinically insignificant cardiac abnormalities. Maggie was referred here for evaluation and possible surgical excision of the mass. Aside from a left grade II/VI systolic heart murmur and moderate gingival hyperplasia, the remainder of the physical examination was unremarkable.

Computed Tomography (CT)

A positive-contrast CT scan of the thorax was performed under general anesthesia, with positive pressure ventilation and breath-hold to maintain inflation and eliminate motion of the lungs during the brief scan. The CT revealed a heterogeneously contrast enhancing soft tissue mass that was likely originating from the accessory lung lobe bronchus, consistent with a primary lung tumor. There were no other masses in the pulmonary parenchyma and no lymphadenopathy to suggest metastasis.

Surgical Treatment

A standard right 5th intercostal thoracotomy was performed with positive-pressure ventilation while the thorax was open. There was a firm tan mass projecting from the pulmonary parenchyma near the hilus of the right accessory lung lobe. Because the mass was contacting the hilus of the right caudal lung lobe as well, excision of both the accessory and caudal lobes was planned. Blunt dissection of the hilus of both lungs was performed as far proximal from the mass as possible. The pulmonary vasculature and principal bronchi to both lobes was occluded using a combination of ligatures and a thoracoabdominal stapler. The excised lobes and mass were submitted for histopathology. The resection site at the hilus was checked for signs of hemorrhage and air leakage during positive pressure inflation. A thoracostomy tube was placed and the thorax was routinely closed. By the end of the procedure, Maggie was ventilating well on her own. Maggie recovered routinely from anesthesia and her thoracostomy tube was removed two days later. After discharge, Maggie remained eupneic, her cough resolved, and she had a surge in appetite and energy level. Subsequent histopathology revealed the pulmonary mass to be a Grade I tubulopapillary

bronchoalveolar carcinoma. The mass appeared to be completely, albeit narrowly, excised. Consultation with an oncologist regarding chemotherapy options was declined by the owner. Periodic thoracic radiography was recommended to assess for recurrence/metastasis.

Discussion

Primary lung tumors are uncommon tumors found in dogs, although some believe the incidence is on the rise. The most common tumor is carcinoma (bronchoalveolar carcinoma, adenocarcinoma, or squamous cell carcinoma) and is typically found in geriatric large-breed dogs. Clinical signs vary with location and size of the mass, ranging from vague signs of lethargy, inappetence, and weight loss to respiratory signs such as a non-productive cough. The patient may be asymptomatic, with the mass incidentally discovered on thoracic radiographs. Diagnosis begins with thoracic radiographs, which oftentimes reveals a large solitary soft tissue mass. Other smaller masses (metastatic lesions), pleural effusion, and atelectasis may also be present. Cytology of the mass obtained by lung aspirate or bronchoalveolar lavage may assist with diagnosis but the definitive diagnosis is usually made on histopathology after surgical excision of the mass. Computed tomography better defines the location of the mass prior to surgery and is superior in detecting metastatic lesions, with 93% accuracy in detecting lymph node metastasis compared to 57% accuracy of radiographs. In one study, radiography only detected 9% of the metastatic lesions visible on CT and the minimum diameter of visible metastatic lesions was 7-9mm compared to 1mm diameter lesions detectable on CT. Detection of tumor metastasis is important because it significantly reduces survival (median survival time of 26 days versus 452 days, with and without lymph node metastasis respectively). The treatment of choice for primary lung tumors is wide surgical excision. This includes thoracotomy or thoracoscopy with lung lobectomy. If metastatic disease is present, adjuvant chemotherapy may also be recommended. However, since metastatic disease significantly decreases survival time, palliative treatment may be recommended over surgery and chemotherapy in these situations.

Summary

Maggie demonstrates a typical patient with a primary lung tumor. A CT was useful in defining the location of her mass and ruling out concurrent metastasis. Treatment for Maggie consisted of surgical excision of the affected and adjacent lung lobes. She recovered well from surgery and her clinical signs resolved, giving her a good short-term prognosis. The tumor was identified to be a low-grade bronchoalveolar carcinoma that was narrowly excised. She will be monitored for recurrence or metastasis but her long-term prognosis is fair.





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